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REMARKS/ARGUMENTS

Claims 11-16 are pending in this application. By this Amendment, Applicants amend the claim 11-14 and 16, and cancel claim 10.

Applicants appreciate the Examiner's indication that claim 15 would be allowable if rewritten in independent form, including all of the features of the base claim and any intervening claims.

Claims 10 and 12-14 were rejected under 35 U.S.C. § 102(b) as being anticipated by Mita et al. (U.S. 5,196,725). Claim 11 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Mita et al. in view of Applicants' Admitted Prior Art (AAPA), and further in view of Wolf et al. ("Silicon Processing for the VLSI Era," Volume 1: Process Technology, Second Edition). Claim 16 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Mita et al. in view of Takekawa et al. (U.S. 4,714,952). Claim 10 has been canceled. Applicants respectfully traverse the rejections of claims 11-14 and 16.

Claim 11 has been amended to recite:

"An integrated circuit package comprising:
a first leadframe;
a second leadframe laminated to a portion of said first leadframe thereby providing a multi-layer laminated leadframe;
a semiconductor die mounted to another portion of said first leadframe; and
a plurality of contact balls mounted on said semiconductor die." (emphasis added)

Claim 12 has been amended to recite:

"An integrated circuit package comprising:
a first leadframe;
a second leadframe laminated to a portion of said first leadframe thereby providing a multi-layer laminated leadframe;
a semiconductor die having opposing first and second surfaces, the first surface of said semiconductor die being mounted to another portion of said first leadframe; and
a third leadframe laminated to at least a portion of said

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second surface of said semiconductor die." (emphasis added)

The Examiner alleged that Mita et al. teaches all of the features recited in claim 11, except for the contact balls mounted on the semiconductor die. The Examiner, further alleged that AAPA teaches contact balls. Thus, the Examiner concluded that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the contact balls disclosed in the AAPA in the invention disclosed by Mita et al. Applicants respectfully disagree.

Not only would there have been no motivation to combine AAPA with Mita et al. but, in fact, Mita et al. actually teaches away from the use of contact balls.

Mita et al. teaches the use of wire bonds connecting the semiconductor die to a signal layer that is electrically connected to the leads 15a and 15b. The purpose of the Mita et al. device is to provide a high pin count or a high number of conductive bonds to external leads 15a and 15b. In fact, the entire reason for providing the multi-layer structure taught by Mita et al. is to provide many external leads or pins 15a and 15b that are electrically connected to the conductive pads of the semiconductor die using wire bonds. The pins of the multi-layer structure provide signal, power and ground connections.

Thus, Mita et al. is clearly directed to providing a package having a high pin count. Evidence of this is provided throughout the Mita et al. reference including, for example, the Title which refers to high pin count and multi-layer wiring leadframe. It is, therefore, clear that the Mita et al. is directed to providing a package with a high pin count for signal, power and ground connections. Since a high pin count or high number of conductive bonds cannot be provided using the contact balls of AAPA, Mita et al. clearly teaches away from using contact balls, as alleged by the Examiner.

The package shown in AAPA Fig. 1 of the present application shows a typical prior art package which includes contact balls for providing signal, power and ground connections. Since the objective of Mita et al. is to provide a high pin count, which

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clearly cannot be achieved by providing contact balls, there would have been absolutely no reason for one skilled in the art to attempt to add the contact balls used for signal, power and ground to the device of Mita et al.

The Examiner is reminded that it is error to find obviousness where references diverge and teach away from the invention at hand. W.L. Gore & Assoc. v. Garlock Inc., 220 USPQ 303, 311 (Fed. Cir. 1983).

Furthermore, due to the structure of Mita et al., it would have been impossible to use contact balls mounted to the semiconductor die of Mita et al. to connect the semiconductor die with the pins (or leads). Referring, for example, to Figure 5a of Mita et al., it would have been absolutely impossible to use contact balls to make the connections that are made by the wire bonds of Mita et al.

While the Examiner has attempted to provide motivation to combine AAPA with Mita et al. by providing the advantages disclosed by Wolf et al., the Examiner has completely ignored the fact that Mita et al. clearly teaches away from Applicants' claim 11 since the objective of Mita et al. is to provide a high pin count for signal, power and ground connections which cannot be achieved using contact balls.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claim 11 under 35 U.S.C. § 103(a) as being unpatentable over Mita et al. in view of AAPA, and further in view of Wolf et al.

The Examiner alleged that Mita et al. teaches all of the features recited in Applicants' claim 12. In particular, the Examiner alleged that Mita et al. teaches a third leadframe 22 laminated to at least a portion of the semiconductor device (i.e. bottom portion). However, the Examiner has clearly ignored features that are specifically recited in Applicants' claim 12.

Claim 12 recites the feature of "a third leadframe laminated to at least a portion of said second surface of said semiconductor die." The Examiner alleged that element 22, shown in Fig. 5(a) of Mita et al., is a third leadframe that corresponds to the third leadframe recited in Applicants' claim 12. However, element 22 of Mita et al. is, in fact,

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not laminated to the semiconductor die 33 at all, and instead, is laminated to the element that the Examiner refers to as the first leadframe (21).

Thus, element 22, which the Examiner alleged corresponds to the third leadframe, is not laminated to the first semiconductor die as recited in Applicants' claim 12, and therefore, clearly cannot be fairly construed as a third leadframe as recited in Applicants' claim 12.

To clarify the structural arrangement of the elements recited in Applicants' claim 12, claim 12 has been amended to recite that the semiconductor die has opposing first and second surfaces, the first surface of said semiconductor die being mounted to another portion of said first leadframe, and a third leadframe laminated to at least a portion of said second surface of said semiconductor die. Thus, Applicants' claim 12 clearly requires a first surface of the semiconductor die that is mounted to the first leadframe, and a third leadframe that is laminated to at least a portion of the second surface of the semiconductor die. This is neither taught nor suggested anywhere in Mita et al.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claim 12 under 35 U.S.C. § 102(b) as being anticipated by Mita et al.

Takekawa et al. was relied upon to allegedly cure deficiencies of Mita et al. However, Takekawa et al. clearly fails to teach or suggest the feature of "a plurality of contact balls mounted on said semiconductor die" as recited in Applicants' claim 11, and the feature of "a third leadframe laminated to at least a portion of said second surface of said semiconductor die" as recited in Applicants' claim 12.

Accordingly, Applicants respectfully submit that Mita et al., AAPA, Wolf et al. and Takekawa et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of elements recited in Applicants' claims 11 and 12.

In view of the foregoing amendments and remarks, Applicants respectfully submit that Claims 11 and 12 are allowable. Claims 13-16 depend upon claims 11 and 12, and are therefore allowable for at least the reasons that claims 11 and 12 are allowable.

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In view of the foregoing amendments and remarks, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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